

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in this application.

LISTING OF CLAIMS

1. (Currently amended) A layer (2''') arranged on an implant (1'') for bone or tissue structure (5), that constitutes a boundary or barrier for the purpose of increasing retention and has a substantial thickness (T'), said layer (2''') further comprising:

a channel network (6) that gives the layer a substantial porosity,

wherein the layer is established on an undulating or uneven surface (3') present on the implant and having a roughness value in the range of 0.4 - 5 μm , for the purpose of increasing the a total layer volume of the layer to a range between 5×10^{-2} and 10^{-5} cm^3 ,

wherein the channel network (6) is designed with has mouths (3', 4') on a surface of the layer adjacent to the bone or tissue structure and whose respective cross-sectional diameters (D) are in the range of 0.1 μm to 10 μm at the surface (2a') of the layer,

wherein the cross-sectional diameters of the mouths are given different sizes to create conditions for bone growth with a predefined penetration function,

wherein the mouths of the channel network is designed with have the mouths having cross-sectional diameters that are substantially less than the respective depths of the channels in and down into the layer as seen from said surface (2a'), and

wherein the diameters of the mouths and the depths of the channels stimulate bone growth by means of diffusion and contribute to the incorporation of the implant in the bone or tissue structure, and

wherein the channel network (6) comprises a combination of contiguous channel branches (12, 13, 14, 15, 16) which extend in at least both vertical and lateral directions within the layer (2''') and toward a transition (11) between the layer (2''') and the implant (1'').

2. (Canceled).

3. (Previously presented) The layer according to claim 1, wherein the channel network (6) has channel branches (10) which extend in directions which are different than a depth direction of the layer or a radial direction of the implant.

4. (Canceled)

5. (Currently Amended) The layer according to claim 1, wherein the layer has a thickness (T) which give a ~~substantial~~ corrosion resistance for the implant as a whole.

6. (Previously presented) The layer according to claim 1, wherein the channel network (6) is arranged with a mouth arrangement (4') towards the bone or tissue structure (5), permitting increased bone growth penetration into the channel at said mouths.

7. (Previously presented) The layer according to claim 1, wherein the layer has an average thickness in the range of 0.5 – 20 μm .

8. (Canceled).

9. (Previously presented) The layer according to claim 1, wherein the layer has a high degree of porosity, with a number $1 \times 10^7 - 1 \times 10^{10}$ pores/ cm^3 .

10. (Previously presented) The layer according to claim 1, wherein the surface has pores or channel mouth areas with the total channel network or pore volume lies in a range of 5×10^{-2} and 10^{-5} cm^3 .

11. (Previously presented) The layer according to claim 1, wherein the layer consists of or comprises a titanium oxide layer.

12. (Previously presented) The layer according to claim 1, wherein the implant consists of a screw implant for application in a jaw bone.

13. (Previously presented) The layer according to claim 1, wherein the layer forms a depot for applied bone-growth-initiating or bone-growth-stimulating agent or substance (17).

14. (Previously presented) The layer according to claim 1, wherein an agent or substance migrates from a depot to the bone or tissue structure (5) by means of concentration diffusion.

15. (Currently amended) An implant (1) for bone or tissue structure (5) comprising:

one or more layers (2) which constitute a boundary (or boundaries) for the purpose of increasing retention and each layer has a substantial thickness, each layer further comprising:

a channel network (6) which give the layer (2) a substantial porosity,

wherein the one or more layers are established on an undulating or uneven surface (3²) present on the implant and having a roughness value in the range of 0.4 - 5 μm , for the purpose of increasing layer a total volume of the layer to a range between 5×10^{-2} and 10^{-3} cm^3 ,

wherein the channel network (6) is designed with has mouths (3', 4') on a surface of the layer adjacent to the bone or tissue structure and whose respective cross-sectional diameters (D) are in the range of 0.1 μm to 10 μm at a surface of the layer,

wherein the cross-sectional diameters of the mouths are given different sizes to create conditions for bone growth with a predefined penetration function,

wherein the mouths of the channel network is designed with have the mouths having cross-sectional diameters that are substantially less than the respective depths (H) of the channels in and down into the layer as seen from said surface (2a'), and

wherein the diameters of the mouths and the extents of the channels stimulate bone growth by means of diffusion and contribute to the incorporation of the implant in the bone or tissue structure

wherein the channel network (6) comprises a combination of contiguous channel branches (12, 13, 14, 15, 16) which extend in at least both vertical and lateral directions within the layer (2'') and toward a transition (11) between the layer (2'') and the implant (1').

16. (Withdrawn) Method for producing, by anodic oxidation, on an implant comprising or consisting of titanium, relatively thick oxide layers (2) on one or more titanium surfaces which are intended to be placed against or arranged next to one or more tissue and/or bone growth areas (5), where at least the part or parts supporting the said surface or surfaces are prepared and immersed in electrolyte (26) and the implant is brought into contact with an electrical energy

source above the electrolyte surface and the oxidation process is established by also connected to the energy source a counter-electrode arranged in the electrolyte (26), characterized in that diluted organic acids and/or small quantities of hydrofluoric acids or hydrogen peroxide are added to the electrolytic composition, and in that the energy source is chosen to operate with voltage values of at least 150 volts, for example with voltage values in the range of 200 – 400 volts.

17. (Withdrawn) Method according to Patent Claim 12, characterized in that the voltage (28) is varied at times for the same implant in order to create different channel or pore sizes within the same surface area.

18. (Withdrawn) Method according to Patent Claim 16, characterized in that the position of the implant in the electrolyte is changed together with the composition of the electrolyte (26) and/or the voltage (28) in order to create different oxide thicknesses (T, T') and/or areas of different porosity or pore or channel characteristics.

19. (Previously presented) The layer of claim 2, wherein the channel network (6) has channel branches (10) which extend in directions which are different than a depth direction of the layer of a radial direction of the implant.

20. (Canceled).

21. (Previously presented) The layer according to claim 1, wherein the layer has an average thickness in the range of 2 -20 μm .